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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,845	07/25/2001	Toshihiko Tanaka	01449/LH	4816

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EXAMINER

STREGE, JOHN B

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,845

Applicant(s)

TANAKA, TOSHIHIKO

Examiner

John B Strege

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-36 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 21-27, 29-34 and 36 is/are rejected.
7) ☒ Claim(s) 28 and 35 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 25 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6,8,10,11.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. USPN 6,438,438 (hereinafter "Takagi") in view of Eskridge et al. USPN 6,597,381 (hereinafter "Eskridge").

Takagi discloses a method for inspecting semiconductor devices (col. 1 lines 10-15). The automatic inspection unit 1 inspects a product and extracts defects according to predetermined inspecting standards (col. 5 lines 26-30)(corresponding to the defect extraction section). The defect information includes images of the defects (corresponding to the image acquiring section), and information on the basis of which the defects are identified (col. 5 lines 35-38). A defect classifying and feature extracting unit 2 classifies defects and extracts the feature data of the defects (col. 5 lines 30-32)(corresponding to the quality judging section). A defect classification indication unit 6 indicates the result of defect classification visually to enable an operator to recognize information (corresponding to the displaying section), further enabling the operator to change the information or add new information thereto (col. 5 lines 45-49) (corresponding to the parameter adjusting section). Then the defect classifying and feature extracting unit 2 changes the interpretation of the feature data of the

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corresponding defect on the basis of the result of defect classification taught thereto by the defect classification indicating unit 6 (col. 5 lines 50-54) (corresponding to an updating section). Further disclosed is an information storage unit 7 stores all or part of defect information about each of the defects in the product received from the automatic inspection unit 1 (col. 6 lines 15-27) (corresponding to the image storing section).

Although Takagi discloses changing the interpretation of the feature data, it does not explicitly disclose that the defect image displayed is updated.

Eskridge discloses a user interface for automated optical inspection systems (col. 1 lines 5-10). Eskridge discloses that the current generation of computer vision systems used for automated optical inspection place a significant burden on the operators to develop programs that will enable the system to classify an image into classes (col. 1 lines 12-15). Furthermore Eskridge discloses that prior art systems do not allow the user to update the system knowledge-base on a real-time basis (col. 3 lines 24-35). To improve automated optical inspection systems Eskridge proposes a GUI system that is both easy to use and provides the operator with the capability to impart information back into the system (col. 3 lines 50-55). The user interface includes at least one view are window for displaying information items, wherein the information items displayed in the window are dynamically linked to one another to provide interactivity between windows and simultaneous updating of related information items in all views. This is done based on the discrimination criteria selected by the user (col. 4 lines 39-60). As a technical advantage, the automated optical inspection user interface is both easy to use and

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provides the operator with the capability to impart defect classification information back into the automated optical inspection system (col. 5 lines 13-18).

Takagi and Eskridge are analogous art because they are from the same field of endeavor of automatic optical inspection.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the system disclosed by Takagi and update the image displayed based on the change feature data. The motivation for doing so would be to allow the operator a better capability to correct the system as disclosed by Eskridge. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Takagi and Eskridge to obtain the invention as specified in claim 21.

Regarding claims 22 and 25-26, Eskridge discloses that the images in the GUI system may be viewed as a series of thumbnail images (col. 13 lines 4-8)(thus they are reduced). Eskridge further discloses that each of the board components may be color coded (col. 8 lines 58-67) and further that the display list area can be colored green if no defects are found, or red if defects are found (col. 10 lines 36-37). Color-coding allows a user to visually detect the presence or absence of defects very quickly, and to do so from a distance (col. 9 lines 1-3).

Regarding claims 23-24, Eskridge further discloses a numerical view area 46 permits the user to change the point of view of the information presented on GUI 2 (col. 9 lines 48-49). Furthermore the user can open a browse window 100 (figure 2) that allows the user to see the current enlarged image and a trained image. This allows the

user to determine whether the currently classified defect looks like a stored defect and decide whether the defect is correctly classified (col. 7 lines 33-44).

Regarding claim 27, Takagi nor Eskridge explicitly disclose a re-displaying button for changing an adjusted parameter back to a former parameter. However, it is well known in GUI systems as well as internet systems to use a return button to return to a previous screen, therefore Official Notice is declared by the Examiner. It would be obvious to have a re-display button with the motivation that a user could return to the original parameter if the parameter selected is unsatisfactory. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a redisplay button as specified in claim 27.

Regarding claim 29-30, Takagi discloses the defect image is compared with a reference image (col. 11 lines 44-57). Classification models stored in the classification model storage unit 352 define regions corresponding to the feature data, and the defect data is compared with this in order to classify the defect (col. 12 lines 1-12). A defect which can not be identified is indicated for the operator and is added to the data base and registered as a classification model (col. 12 lines 30-34). Various feature data is extracted including texture information, color or density distribution, etc. (col. 11 lines 58-67). This entire process can be read as a recipe.

Regarding claim 31, Takagi discloses a predetermined inspecting standard to extract images (col. 5 lines 27-30).

Regarding claims 32 and 34, Takagi discloses that if the inspection unit leaves some defects undetected, the inspection parameter adjusting unit adjusts the thresholds

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of the inspection standards (col. 13 lines 45-47). If failure in detection of defects is attributable to the defocusing of the image sensing unit, the inspection parameter adjusting unit adjusts focusing parameters (col. 13 lines 48-51). If it is a result of the illumination, then the inspection parameter adjusting unit adjusts the luminance of the illuminating unit. Both of these settings would inherently include upper and lower limit values since the illumination could be too bright or not bright enough. Furthermore, Eskridge discloses that in that in prior automatic inspection systems it is well known to manually program component defect detection algorithms, or to adjust algorithm threshold values (col. 10 lines 54-58). This allows for short production runs in which troubleshooting a defect can be reduced from a matter of minutes to a matter of seconds, thus making the system cost effective (col. 10 lines 58-65). As discussed Takagi discloses a defect classification indication unit 6 that indicates the result of defect classification visually to enable an operator to recognize information. Furthermore Takagi discloses that the defect classification and data extraction can be repeatable whenever necessary since the conditions can be read from the image data storage unit and can be displayed at on the terminal equipment (col. 12 lines 60-64).

Regarding claims 33, as discussed Eskridge discloses displaying thumbnail images in a list, and updating images. Takagi discloses that after the category of the defect has been determined, information is given to the process control system, the machine parameter adjusting unit and the inspection parameter adjusting unit, and the stored image data is updated. The parameter, such as the detection wavelength used

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by the wafer inspecting system, can be changed by the inspection parameter adjusting unit on the basis of the data provided (col. 18 lines 35-44).

Regarding claim 36, as seen in figure 1 section 46 Eskridge discloses preparing a plurality of groups of parameters for kinds of defects such as presence, polarity leads, etc. As discussed Takagi discloses a parameter adjusting unit.

Allowable Subject Matter

3. Claims 28, and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kiyasu et al. USPN 5,440,649 Method of and apparatus for inspection of external appearance of a circuit substrate, and for displaying abnormality information thereof.

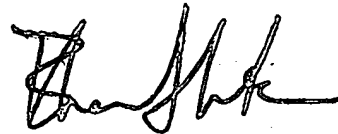
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B Strege whose telephone number is (703) 305-8679. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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